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Quantified Selves

Abstract: *The title of this chapter is taken from the quantified self movement, where people track and analyse aspects of their lives such as steps, travels, productivity, location, glucose, heart rate, coffee intake, sleep and more to understand and improve themselves. Quantified self-representation has rapidly become common far beyond this movement, though: one in ten Americans owns an activity tracker such as a Fitbit or Nike Fuelband, and there are hundreds of other devices and apps to measure different aspects of our lives. This chapter considers what we can measure about ourselves and what we cannot measure, and the consequences of seeing ourselves as data bodies, using smart baby monitors, sex tracking and activity trackers as examples. Concepts discussed include dataism, the new aesthetic and machine vision.*

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Towards the end of 2013, I attended a meeting held by the Bergen Chamber of Commerce on social media marketing. Several hundred marketers ate lunch as they listened to a presenter explaining her company's successful Facebook marketing campaign. 'The wonderful thing about digital media,' she said, 'is that you can measure everything.' Her company was launching a new social media marketing strategy, and she was thrilled at how easily they were able to track their progress: how many likes each post received, the age groups who were following the page and how many times different kinds of posts were shared. Administrators of Facebook pages can see at a glance that more people click 'like' on certain kinds of post or on items posted at certain times of the day or of the week.

Being able to measure something gives us the sense that we can control it. We can work to improve it, whether it's a marketing campaign or our productivity or our health. Having measurements readily available can also make us forget about all the things we cannot measure.

There are currently different kinds of activity trackers commercially available, with names such as Fitbit, Nike Fuelband, Jawbone Up, Withings Pulse, Misfit Shine and many more. They are worn on wristbands, hung from necklaces or clipped onto pockets, and measure how many steps we take, how many stairs we climb, what our heart rates are or how we sleep. They sync to websites or phone apps in which graphs are generated and daily averages calculated. They connect to other apps, like My Fitness Pal in which you enter all the food you eat to compare your calorie intake with the calories your stepcounter tells you that you burn, or Runkeeper, which uses GPS to track your runs, or other devices such as Withings scale that uploads your weight to the Internet. There are blood pressure monitors for people concerned about their heart, glucose monitors for diabetics and heart rate monitors for amateur and professional athletes. There are to-do apps that show us how efficient we are and time monitors that track whether we're spending time using a word-processor or checking Facebook.

We don't typically think of these self-tracking tools as self-representations in the same way as we do self-portraits or diaries, but they do preserve and present images of us: images that are both very accurate and very narrow, whether they track steps, heart rate, productivity or location. Fifteen years ago, well before smartphones and Foursquare, I walked out on the balcony at a party and noticed a woman fiddling with a GPS, setting her coordinates. She told me that most people didn't

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understand why she liked to do that. But her grandmother did: 'Oh, I see, love,' her grandma had said, 'it's like a diary!' And that is exactly how this woman used her GPS – as another way of documenting her life and keeping memories.

I have a travel diary my grandmother kept during a trip by boat to Europe in the 1960s. There is nothing personal in the diary: each day there is simply a note of each port of call. Sometimes she would add what they ate for dinner. Today, Foursquare serves the same purpose for me. I check in at places I want to remember, or that I want to tell people about, and sometimes, often when I return to a city I have previously visited, I look back through my history, and the list jogs my memories so I remember much more than the simple names of cafés or sites that Foursquare reminds me of. This simple data, then, means more to me than to a random observer. When my grandmother looked at her sparse travel diary, she remembered her trip, whereas I only see a list of places and meals. Sometimes our own lists of data and the quantified charts that track aspects of our lives might even give us the sense of *punctum* that Barthes wrote of seeing in certain photographs, though others would see nothing but a *studium*.

A fantasy of knowing

'Self Knowledge Through Numbers' is the slogan of the Quantified Self movement, a group of people who use wearable devices, spreadsheets, notebooks and more to track and analyse data about themselves. The quantified self conferences, meetups and blogs showcase individuals' stories about how they have used self-tracking to improve their lives, become more productive, manage a disease, sleep better, lose weight, become fit and even find romance. Conferences, meetups and blogs host 'show and tell' talks where presenters explain what they did, how they did it and what they learnt. Many quantified selfers use consumer devices such as activity trackers or glucose monitors, but their analyses of the data provided tend to go beyond the standard visualisations provided by the brands' own websites or apps. Quantified selfers use spreadsheets, statistical tools and visualisation software to understand and present their data.

Although people have been tracking their personal data for centuries, the combination of data generated through wearable devices and online

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services that can automatically log personal data with our increasing ability to store and process large quantities of data has led to a surge of interest in personal tracking and data analysis. The interest isn't solely driven by technology. Society in general is increasingly invested in quantitative measures that we hope will allow us to improve our performance. My six-year-old daughter brought reports home from her Chicago Public School kindergarten class this spring telling us exactly what percentile she was in for reading and mathematics. I can go online and see a detailed 'report card' of her school, with precise numbers for ethnic and income diversity, truancy rates, children's average test scores and more. Back home in Norway there is less emphasis on standardised tests and quantitative comparisons of schools, but even here, standardised tests have been implemented for some grade levels. We can compare scores at the level of the child, the school, the district and even the country through the PISA scores. At the University of Bergen where I work, the Humanities Faculty works out whether to replace a professor who retires with a new professor in the same field or to use the resources elsewhere by annually feeding a complicated spreadsheet information such as how many credits students have taken in each discipline, how many articles and books were published by our colleagues in each field, how many PhD students have completed their degrees in which subjects and so on. If there is money to hire three new associate professors one year, the spreadsheet calculates which departments and fields need the jobs the most and presents the faculty board with a prioritised list. To be sure, this may be fairer than the old system, where, according to legend, whichever head of department wept the most convincingly in front of the dean got the new jobs, but it is also an interesting example of our increasing reliance on data and numbers above qualitative interpretation. This is the way we run our education systems, our companies and our lives now: by analysing the data. Of course we use data in our self-representations.

Our quantitative self-representations are not entirely objective, though the numbers, checkboxes and graphs give them that appearance. In reality, of course the data is fuzzy. When I use Nicolas Felton's app Reporter to record information about my days I might lie, a little, about the information I enter. It beeps and asks me to tell it whether I'm working or not when I'm actually on Facebook, but because I just spent an hour writing maybe I'll tell it I'm working anyway. Or I put my phone away at 11 pm, telling Reporter that I'm going to sleep, but get distracted and don't actually go to bed for another hour. Perhaps I really do write for eight hours

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one day but the five times the app prompts me to tell it what I'm doing I happen to be taking breaks, and I'm honest about my answers each time. Then Reporter will actually misrepresent me as not having worked that day. Sometimes we fudge the data to make ourselves look better (even just to ourselves) and other times we fudge it to represent ourselves in a way that feels more accurate, although it may not be exactly true.

When we slip an activity tracker onto our wrist rather than enter data manually, the output may feel less subjective. We have less direct control over it. The number of steps is precise – 9028 steps, not 'around nine thousand', although of course if we forget to put the tracker on and go for a bike ride, the step count may not reflect our true activity during a day. When I wore a Fitbit and later a Misfit Shine they produced graphs showing exactly how much deep and light sleep I got (though not what was really meant by those categories), how long it took me to fall asleep each night and on average, and how many times I woke during the night. I loved seeing all this information, although I had never before realised that these were things I wanted to know.

Quantitative self-representations can be like visualisations of big data, in that they, represent 'a fantasy of knowing, or total knowledge' (McCosker and Wilken 2014). We think that the numbers tell us the objective truth.

New parents are one group targeted by data tracking services. New parents are sleep-deprived, hormonally and emotionally all over the place, and desperate to get some sleep and keep their babies safe. In 2008 I used the TrixieTracker website to track my four-month-old baby's sleep patterns (J.W. Rettberg 2009). Being sleep-deprived, I had read what felt like dozens of books about helping babies sleep regularly and most of them recommended keeping track of your baby's natural schedule to look for patterns. Then, in theory, you could figure out how to get your baby on a schedule that let you get more sleep. Does the baby sleep better if her bedtime is earlier or later? Does she wake more or less frequently during the night if you keep her awake and active for several hours before bedtime? Does she fall asleep more quickly if she just ate or if she played before being put down? I desperately wanted answers that would let me (and my baby) get more sleep.

TrixieTracker wasn't automatic. I had to click a button on the website (which I could access from my smartphone) to register when I put our baby down in her crib, when she actually fell asleep and when she woke up. I could enter information about when she ate and from which breast

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she nursed and about the contents of her nappies. Some parents tracked this sort of information about their babies long before there were digital aids. Having lunch in a café with a group of other mothers and babies, I noticed one of the other mothers pull out a sheet of graph paper with a carefully colour-coded chart. When I asked her about it, she showed me how she used different colours for sleep and awake time, and also marked nappy changes and feedings. She had kept these charts faithfully for each of her babies, and said she found them very helpful. As she spoke, she marked the chart to show that she had fed her baby 10 minutes earlier.

I used TrixieTracker for a few months and enjoyed seeing the charts it generated. Ultimately I didn't find any useful patterns, other than the rather obvious finding that as our baby grew older she fell asleep more easily and woke less frequently during the night. I probably would have noticed that without the charts, but I enjoyed having the visual material to look at. I even put a printout of one of the charts in my baby's baby journal.

Tracking quantitative information about babies is taken for granted today, but systematic weighing of newborns at birth did not begin until the late eighteenth and early nineteenth century (Oppenheimer 2013, 114), and weighing babies and children at regular intervals was not introduced until the mid-nineteenth century (115). For today's parents, measuring babies starts during pregnancy, when each doctor's visit includes weighing in, measuring the height of the uterus and a blood test. Results are entered into a journal, marked on a chart showing normal growth curves and very clearly measured as normal or concerning. Once the baby is born, this quantitative measurement transfers from the mother to the baby. The baby's weight and length at birth are proudly announced to friends and family. They are measured again at each visit to the doctor or nurse, and the medical professional plots the data onto a standardised growth curve, pronouncing at which percentile of the population the baby weighs in at. If the baby doesn't gain weight at the expected rate, parents are asked to feed the baby more, to nurse more frequently or in a different way or to supplement with formula. If the low growth rate persists the doctor will look for other causes. Measuring babies and children is seen as an important part of preventative health care today.

A friend told me about her deep guilt when she realised that her two-week-old baby had not gained back her birth weight. 'I was starving my baby,' she sobbed. New parents experience real anxiety – and conversely real comfort – from seeing objectively whether their baby is thriving or

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not. When you have a fussy or colicky baby that cries inconsolably for hours every day, it is comforting to be told by a medical professional that your baby is thriving, which generally means that the measurements show that the baby is gaining weight just as expected. But the desire for clear, objective, rational information about your baby can get out of hand. When my oldest child was a few weeks old, another new mother mentioned that her baby hadn't gained much weight in the last week. 'How do you know?' I asked. She explained that she came in to the clinic twice a week just to weigh her baby. It hadn't even occurred to me that this was a possibility or something you might want to do, and the nurse had told me that my baby's growth was just fine, but hearing about the other mother's diligence I immediately felt guilty for not having worried about my baby's weight. So I started coming in twice a week and got more and more worried as I saw my baby had no weight gain at all for several days. Fortunately, the nurse caught me at it and explained that weight fluctuates from day to day and that there is really no point in weighing a healthy baby too often. It does no good, and often does harm in that it worries the parents unnecessarily. I stopped coming in between appointments and my baby was fine.

Today's new mothers can buy baby scales that connect to the Internet and generate growth curves you can view on your smartphone. The Withings Baby Scale even connects to Nestlé's capsule-based baby formula making machine, the BabyNes, so you can use one app to monitor your baby's growth *and* to know how many bottles of milk you prepare for the baby. You can annotate the data to show how much your baby actually drank, too. Following EU law, Nestlé of course notes in their marketing of the system that breastfeeding is the ideal nourishment for your baby, but the very existence of this app showcases how the perceived *objectivity* of technology and quantitative measurements can be seductive. The ease of measuring how much formula a baby drinks is one of the reasons why bottle feeding for a long time was preferred to breastfeeding by the medical establishment. You can weigh a baby before and after it is breastfed to measure how much milk it drank, but this is more cumbersome than simply looking at the millilitre markings on a bottle of milk.

Baby monitors have also become quantified. Wearable devices for babies include the Mimo Baby Monitor where babies wear a specially designed onesie (the 'Kimono') which has a soft rubber spot that holds a monitor, called the 'Turtle'. This connects to a web service that sends data about the baby's breathing, body temperature and movements to an

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app for a smartphone. Graphs showing the waves of regular breathing are generated, and alerts sound to let you know if the baby is restless, too cold or too hot or sleeping on his tummy instead of his back or side. Trends and analytics can be viewed over time. The Sproutling ankle band, due to go to market in late 2014, will alert you when your baby is about to wake up. Mats that monitor babies' breath and similar technologies are already in use in hospitals and at home for premature babies or babies who are particularly at risk for SIDS or other medical problems, but they are now being marketed to parents of healthy babies as though every baby needs this kind of constant medical monitoring.

Dataism and subjective data visualisation

Dataism is José van Dijck's term for the common assumption that people and behaviours can be adequately represented by quantitative means and 'big data.' She writes that 'the ideology of *dataism* shows characteristics of a widespread *belief* in the objective quantification and potential tracking of all kinds of human behavior and sociality through online media technologies' (van Dijck 2014). Often big data analysis works, in the sense that it can be used to predict buying patterns or personality traits, and van Dijck cites a number of scholarly articles showing direct connections between data such as tweets and personality traits or between liked pages on Facebook and sexual preferences. Dataism is becoming 'a belief in a new gold standard of knowledge about human behavior', van Dijck writes, and argues that it is crucial to be aware of the different reasons for and contexts within which data is gathered. We also need to realise that data is interpreted by analysts.

The data gathered about us by our devices becomes an artifact that is separate from us and can be viewed at a distance. At the same time, it represents us, or a part of our lives. Minna Ruckenstein (2014) calls this personal data a *data double*, a term taken from a much-cited article in surveillance studies where Kevin D. Haggerty and Richard V. Ericson use Deleuze and Guattari to analyse the ways in which once separate flows of information about individuals are put together:

> This assemblage operates by abstracting human bodies from their territorial settings and separating them into a series of discrete flows. These flows are then reassembled into distinct 'data doubles' which can be scrutinized and targeted for intervention. (Haggerty and Ericson 2000, 606)

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Heart-rate variability monitors can indicate levels of stress and recovery, and Ruckenstein's survey looked at how a group of users of such monitors reacted to the personal data collected about their heart-rate variations using a monitor. Although the users did negotiate and interpret their data doubles, comparing the data to experiences in their lives during the period they had worn the monitors, Ruckenstein (2014) notes that

> Significantly, data visualizations were interpreted by research participants as more 'factual' or 'credible' insights into their daily lives than their subjective experiences. This intertwines with the deeply-rooted cultural notion that 'seeing' makes knowledge reliable and trustworthy.

The way in which we choose to visualise data is important. Data, Johanna Drucker (2011) writes, is assumed to be a '"given" able to be recorded and observed'. She proposes that instead of talking about data, we should use the term *capta*, which would emphasise a constructivist approach: capta is *taken* from reality, while data is conceived as *given*, objective. Similarly, Annette Markham (2013b) notes how the meaning of the term data 'gradually shifted from a description of that which precedes argument to that which is pre–analytical and pre–semantic. Put differently, data is beyond argument. It always exists, no matter how it might be interpreted. Data has an incontrovertible "itness"'. Susan Sontag notes something similar of our assumptions about the reality of photographs:

> What is written about a person or an event is frankly an interpretation, as are handmade visual statements, like paintings and drawings. Photographed images do not seem to be statements about the world so much as pieces of it, miniatures of reality that anyone can make or acquire. (1973, 4)

Of course, as Markham and Sontag also argue, neither data nor photographs are truly 'pieces of the world' devoid of interpretation. They are representations, but ones that we tend to find more authoritative than more obviously qualitative representations.

An alternative approach is taken by many francophone theorists, who use the term digital traces (*traces numeriques*) to refer to the tracks we leave behind us when we use digital media. Tyler Butler Reigeluth (2014, 249) explains that a trace 'corresponds to some minute detail or seemingly insignificant fragment such as the chemist's residue, the detective's clue, the historian's indices, or the psychoanalyst's symbol,' and although the meaning of the word *trace* in French doesn't completely correspond to the same word in English, it does seem that the concept of digital

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traces carries with it more uncertainty and subjectivity than our English *data*. We do not take the traces of a person (footsteps in the snow, steps measured by a Fitbit) as being the same as the person herself. Or as Drucker (2011) puts it,

> Rendering *observation* (the act of creating a statistical, empirical, or subjective account or image) as if it were *the same as the phenomena observed* collapses the critical distance between the phenomenal world and its interpretation, undoing the basis of interpretation on which humanistic knowledge production is based.

Drucker argues that to visualise subjective data (or capta, in her terminology), we need subjective, qualitative graphics as well. Perhaps we could think of the Fitbit's glowing flower that grows throughout the day the more that you move as a somewhat subjective visualisation of your activity. The Misfit Shine shows little glowing dots instead of precise step counts. The Withing Activité has an analogue clock face with a pointer moving clockwise from 0 to 100 to show whether the user has taken enough steps that day. These less precise visualisations show a desire to humanise our data, although the premise is still that you are at a measurable point on your way to a fixed goal.

Measure more

I put my hand up at the Chamber of Commerce meeting, to ask the social media marketers what they would do if they found that the measurements they had access to weren't telling them everything they needed to know. 'Measure your results, adjust your actions, and measure again,' said the presenter.

Another of the presenters spoke up. It was Anders Brenna, a Norwegian technology expert who is highly influential in Norwegian social media circles. 'You just need more measurement points,' he said. 'If you look at a map of weather stations,' he continued, 'you will see that they are close together in some parts of the world and very far apart in other parts of the world. When they put more weather stations in, the weather forecasts become more accurate.'

Of course this is true, up to a point. More measurements and more different kinds of measurement can make forecasts and analyses more accurate, or more appealing. Often, extra measurements are crowd-

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sourced. Minutely, a weather forecasting app, combines traditional forecasts with allowing users to report the weather in their own location by selecting an icon with a brief description: Sunny, Mostly Sunny, Overcast, Drizzle and so on. There's also an option to share a photo and type in a brief message. This potentially combines a subjective sense of the weather with the automated reports, but in practice the shared weather is hidden in the interface, and seeing other peoples' reports is not easy. Still, being able to correct the weather app and tell it (and potentially other users) that in fact it is not raining where I am can feel satisfying. The ability to share one's personal weather report and comments directly to Twitter or Facebook also suggest that this feature is more about self-expression than about the subjective human experiential data actually influencing the machine.

Tracking data isn't simply about the data, either. Once we have personal, quantified data about ourselves, we look at it and we interpret it. We use the data to adjust the stories we already tell ourselves about our lives, and we use our stories about our lives to adjust, excuse or understand our data. Ruckenstein writes that 'once visualized, the data generates new kinds of affective ties between people and their measured actions and reactions.' She continues, referencing a study by Bjarke Oxlund (2012, 50): 'For instance, pedometer users can cherish the steps they have taken and develop a more affective relationship either to their walking or the steps taken; numbers acquire qualities that promote new kinds of walking-related practices' (Ruckenstein 2014). In her own study where participants tracked their heart-rate variability, Ruckenstein found the same 'affective ties,' and notes that having the data can make people feel more pride in what they do:

> Similarly, the monitoring of the quality of sleep through heart-rate variability measurements can deepen affective relations to one's body. When sleeping is subjected to tracking, it becomes an activity, or even a competence, that people feel that they are good at. On the other hand, the tired body, pinned down by personal analytics, reflects exhaustion caused by the energy that people put into work and care for others, thereby making their contributions visible and of value. (Ruckenstein 2014)

Another study of users of activity trackers found something similar, when informants used their data almost as vindication: 'they were aggrieved by the amount of activity they were doing and somehow wanted to underline their effort' (Rooksby et al. 2014, 1168).

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Self-tracking can be used as a means of power, whether to make contributions visible or to fight back against surveillance. UPS drivers are monitored in great detail throughout their workday: digital equipment in their trucks track when parcels are delivered, how long the truck is stopped, whether the seat belt is fastened, how much the truck backs up and more. On 1 July 2010, the drivers' union, Teamsters for a Democratic Union (TDU), published a printable 'Package car driver OJS tracking sheet' on their website to allow drivers to track themselves and their supervisors so as to have documentation if their employers attempted to hold them to a measured speed of delivery that is not representative of a normal work day. 'Track the Supervisor like They Track You,' a union representative says on the website. This is what Steve Mann has dubbed 'sousveillance': ordinary citizens watching authorities rather than the other way around (Mann, Nolan, and Wellman 2003).

What we cannot measure

The sex tracking app SpreadSheets offers a striking example of how little our devices can really measure. Spreadsheets is an iPhone app that promises to measure and quantify our sexual activity. Similar to one of its forerunners, Bedposted.com, its purpose is to create a log of each time you have sex, but while Bedposted.com required you to enter the information yourself (J.W. Rettberg 2014, 87–8), Spreadsheets monitors your sex life automatically. That is, Spreadsheets tracks every aspect of sex that an iPhone can automatically track when placed on a bed: frequency of thrusts, total duration of thrusting activity and the decibel levels of the participants in the act. That's really all an iPhone can automatically measure about sex: motion, sound and when that motion and sound begins and ends. As Whitney Erin Boesel (2013) points out in a blog post to *Cyborgology*, that means that this app can only measure a very heteronormative idea of sex as thrusting penetration.

The Spreadsheets app applies a technological filter to its representation of sex. The representation is constrained by what an iPhone can measure. Interestingly enough, though, the way a machine – or specifically a smartphone in the early twenty-first century – can understand or perceive sex is very close to a strong cultural understanding of sex that we are familiar with from traditional pornography. Sex seen through this cultural filter is all about thrusting hard and fast, screaming loudly

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and keeping at it for as long as possible. But we all know that that is not all there is to sex – far from it. Notably Spreadsheets cannot perceive aspects of sex that do not involve thrusting or loud vocalisation, such as caresses, kisses or whispers. And importantly, Spreadsheets can do nothing to measure our emotions during lovemaking.

Following Anders Brenna's example of the weather stations, we might argue that all Spreadsheets needs to do is to install more measuring stations and measure more. It is certainly possible to imagine specialised appendages that could be plugged into a smartphone and worn on or inserted into bodies to measure other aspects of sex than thrusts and decibels. They could use the 'happiness blankets' that British Airways used to market their flights in June 2014: in a video advertisement, passengers wore headbands that measured their brainwaves, and the blankets, which had threads of LEDs woven through them, glowed red when passengers were anxious and blue when they were calm and happy (British Airways 2014). A device could even analyse users' blood to gauge something of their emotional arousal. No doubt such devices are already used in medical research. Last year, a Dutch team of researchers developed a tool to automatically log unconscious emotions by analysing physiological data, arguing that 'To offer capabilities that are superior to diaries, lifelogging applications should try to capture the complete experiences of people including data from both their external and internal worlds' (Ivonin et al., 2012). But could even a fastidiously detailed computational analysis of a sexual encounter represent it in a way that felt meaningful to the people involved?

If we see ourselves and expect to be seen as data bodies, as quantifiable selves, what do we see? What is left out? Would we want a 'happiness blanket' to tell everyone around us whether we are calm or anxious? Do we want automated diaries to tell us about emotions we aren't even aware of?

The pleasure of control

Works of fiction can critique society and technology as strongly as scholarship or critical works, and often more evocatively and memorably. Dave Eggers novel *The Circle* (2013) tells the story of Mae, who begins to work for The Circle, a company that is a sort of amalgamate of our Facebook and Google, but even more sinister. Mae is rapidly fitted with various tracking devices, from a wristband that monitors her health

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to productivity trackers to monitor her efficiency in responding to customer calls. In her first weeks she is surprised at some of the monitoring, but after a disciplinary conversation with her superiors, Josiah and Denise, who question her lack of involvement in social media, she throws herself into it wholeheartedly and eventually goes 'transparent', wearing a video camera that streams to the Internet at all times. 'Privacy is theft', she declares, and 'Sharing is caring'. The main characters use wearable devices constantly, and their different comfort levels with this are interesting to follow. Mae enjoys the objectivity of the devices that track her.

> She knew her heart rate and knew it was right. She knew her step count, almost 8,200 that day, and knew that she could get to 10,000 with ease. She knew she was properly hydrated and that her caloric intake that day was within accepted norms for someone of her body-mass index. It occurred to her, in a moment of sudden clarity, that what had always caused her anxiety, or stress, or worry, was not any one force, nothing independent and external – it wasn't danger to herself or the constant calamity of other people and their problems. It was internal: it was subjective, it was *not knowing*. It wasn't that she had an argument with a friend or was called on the carpet by Josiah and Denise: it was not knowing what it meant, not knowing their plans, not knowing the consequences, the future. If she knew these, she would be calm. (194)

Mae loves *knowing*, and believes that *not knowing* is what has caused her stress in the past. This idea that technology can be a neutral, objective observer that can alleviate the uncertainty of human perception is alluring to many. As Melissa Gregg (2014) writes about productivity apps, they 'facilitate the pleasure of time management, which is ultimately the pleasure of control'. Gregg continues by noting that productivity apps 'offer strategies for closure and containment, from shutting down email and non-essential communication to identifying peak performance periods and ideal moments for efficiency.'

Closure and containment, knowing rather than not knowing, are seductive possibilities to many. Most activity trackers do not offer a great deal more than telling us how many steps we walk each day, but they also convert this into an estimation of calories burned and invite us to enter information about the calories we eat. This is a messy business at best. Most of the calorie tracking sites have databases of foods, and US fast food or grocery store brands are far better documented than foods from other countries or homemade food. If you search MyFitnessPal for

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'tomato soup' you get a list of various 'tomato soups' in the database, some entered by users and some harvested from companies' information about the foods they sell. There's some user's homemade soup at 156 calories a cup and Campbell's canned tomato soup at 110 calories for half a cup. Panera's creamy tomato soup is 210 calories for 12 oz and Cosi's is 401 calories for 10 ounces. A user may not be sure which soup she is eating or exactly how many ounces or cups she has, and user-entered nutrition information for soup or any other dish may be completely wrong, but despite any doubt in the process of entering this data, once it is entered it is treated as exactly accurate. Calories are added up precisely, steps are counted, and you are told precisely how many calories too many or too few you have eaten. When you click 'finished logging for today' the app quickly calculates what you would weigh in five weeks if each day was like today. Any uncertainty is erased by the apparent precision of the data.

The Withings app on my phone, HealthMate, pulls in data from MyFitnessPal and our Withings 'smart scale' and uses this to generate even more graphs. It tells me that at 10 am my calorie intake is 228 calories and my calorie outtake is 789. I should probably have something to eat. The air quality around my bathroom scale is good, at least as measured by CO_2, which appears to be the only aspect of air quality the scale measures, and the temperature in my bathroom is 19.6°C. It tells me my heart rate the last time I weighed myself and my body fat percentage. My Fitbit told me how often I had woken during the night, and my Misfit Shine told me whether my sleep had been 'light' or 'heavy'.

Most of this data is useless, mere decoration, eye candy. Why keep detailed daily logs of my heart rate when I step on the scales or the temperature in the bathroom? Why know how much 'deep sleep' I got when nothing on the Misfit website can explain what that term means, or what might be optimal? If I am a data body, which data is meaningful?

Machine vision

When we use devices to represent ourselves, we rely on what the devices are able to measure. The step monitor doesn't really measure how many steps I take, it measures how often it moves in a way that tends to correlate to the way the device would move if a human, wearing it, took a step. My waving it up and down in a certain pattern can trick it into thinking

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I took more steps and my forgetting to carry it with me means it doesn't know about all the steps I take. And yet it continues to appear absolutely confident about my calorie outtake for the day.

In April 2011 iPhones running iOs 4 were found to be tracking all location data (up to 100 cell tower ID points a day) and saving this, unencrypted, to any computer the user synced the phone with (Arthur 2011). James Bridle is a British artist and designer who decided to exploit his own data, so he downloaded all the location information that his phone had been collecting without his knowledge and created a book full of maps of his whereabouts over the last year. The book is titled *Where the F**k Was I?* because Bridle found that he did not, in fact, remember all the places that the phone had registered him as visiting. The book of maps was not a representation of his experience, Bridle (2011) wrote, it was the experience of the phone itself:

> This digital memory sits somewhere between experience and non-experience; it is also an approximation; it is also a lie. These location records do not show where I was, but an approximation based on the device's own idea of place, its own way of seeing. They cross-reference me with digital infrastructure, with cell towers and wireless networks, with points created by others in its database. Where I correlate location with physical landmarks, friends and personal experiences, the algorithms latch onto invisible, virtual spaces, and the extant memories of strangers.

In this case, the human user did not know that the data was being collected and saved and did not consciously contribute to it. Other location-based services, like Foursquare, or its forerunner, Gowalla (Hooper and Rettberg 2011) require users to check in manually, deliberately choosing to make a note of having been in a specific location. Rather than location-tracking, this is known as location-sharing (Cramer, Rost, and Holmquist 2011, 57). Users don't check into every place they are. If you search, you can easily find etiquette guides posted on blogs, ironically or earnestly warning you not to check in to places that are boring (the gas station or grocery store), creepy (a brothel) or insensitive (a funeral home). Others warn that you risk being targeted by muggers if you check in at a bank or by stalkers if you check in at your home. A list of places you've checked into becomes a kind of curated self-representation, and as Lindqvist et.al. note, users choose not to check into places they feel embarrassed about or would rather not publically share: a fast food restaurant or a strip club, for instance, although not all

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users find these locales embarrassing (Lindqvist et al. 2011). The reasons for choosing to check in are varied. Some checkins are purely pragmatic, to coordinate with friends, but there are many other reasons for checking in, such as self-representation, boredom, playing a game, wanting to bookmark a place for future reference (Cramer, Rost, and Holmquist 2011), or 'documenting habits and sharing new experiences' (Hooper and Rettberg 2011). Venues on Foursquare are user-created and do not always have a one-to-one relationship with 'real' places. Sometimes checkins are deliberate rhetorical or communicative acts rather than statements of presence. For instance, during the heat wave in New York in the Summer of 2010, the 'Heatpocalypse NYC' received 9426 check-ins (Cramer, Rost, and Holmquist 2011, 62). In the Netherlands, game scholar René Glas describes how an abandoned high school inhabited by squatters was given the Foursquare name 'Hangout for idlers, potential criminals and people who've lost their ways' (2011, 12). When you use Foursquare you are invited to add 'tips' about venues for other users, and the prompt when you click on the 'Add a tip' button gives advice on how to write a tip: 'For example: Get the table by the front window for some of the best people watching in the city.' Tips users have left for the abandoned high school instead discuss how the local government has allowed the neighbourhood to become impoverished (Glas 2011, 13).

Individuals can create lists on Foursquare, and this can also be used as a form of self-expression. A literary example is *Derby [2061]*, a science fiction story created by the UK design agency Mudlark that is told through Foursquare. 50 fictional future Foursquare venues were created in the same geographical locale as present-day places in the town of Derby, and the story's protagonist, 'Girl X', has left tips in each place that taken together give an impression of a future society, set in the year 2061. Following our Foursquare friends we can similarly glean a partial story of their lives, though usually the story is far less cohesive than that told in *Derby [2061]*.

In 2014, Foursquare moved to 'passive location-sharing' with the new app Swarm. Rather than needing to check in, Swarm shares your approximate location with friends. A few months later, the Foursquare app also changed, rebranding itself as a recommendation engine primarily for restaurants rather than as a social travelogue. Although Swarm does still allow users to check in manually and to create new places, the changes signal a shift from human-generated to machine-generated self-representations, which we also see in other areas. Foursquare and Swarm

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are moving away from being shared diaries to being commercial marketing platforms that represent us to our friends to convince our friends to buy certain services rather than others.

A few months after James Bridle created the book from his iPhone location log he wrote a blog post proposing the term 'the new aesthetic' to describe artistic and aesthetic projects that play with the idea of aesthetics that is created for or by machines (Bridle 2014). Rather than using words, Bridle states his case by gathering together groups of images of artworks and design.

One of Bridle's examples is CV Dazzle makeup, which is intended to be used in protests and riots where the human users do not want their faces to be recognised as human faces by surveillance cameras and face recognition software. Similarly, military aircraft and drones may have huge pixels painted on top to camouflage them from surveillance systems in satellites. If we are adjusting the way we express ourselves so that it can be read by machines, are we really speaking primarily to the machines and not to each other? Even if we are creating something for ourselves or for other humans, we have to mould our expression to what the devices we are using can perceive. Who—or what—are our self representations addressing?

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